

NON-PUBLIC?: N
ACCESSION #: 9201210284
LICENSEE EVENT REPORT (LER)

FACILITY NAME: Surry Power Station, Unit 2 PAGE: 1 OF 03

DOCKET NUMBER: 05000281

TITLE: High Steam Generator Level due to Main Feedwater Regulating Valve
Oscillations Results in ESF Actuation and Reactor Trip
EVENT DATE: 12/17/91 LER #: 91-011-00 REPORT DATE: 01/14/92

OTHER FACILITIES INVOLVED: DOCKET NO: 05000

OPERATING MODE: N POWER LEVEL: 023

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR
SECTION:
50.73(a)(2)(iv)

LICENSEE CONTACT FOR THIS LER:
NAME: M. R. Kansler, Station Manager TELEPHONE: (804) 357-3184

COMPONENT FAILURE DESCRIPTION:
CAUSE: X SYSTEM: SJ COMPONENT: FCV MANUFACTURER: C635
REPORTABLE NPRDS: Y

SUPPLEMENTAL REPORT EXPECTED: No

ABSTRACT:

On December 17, 1991, at 2254 hours, with Units 1 and 2 at 100% and 23% power, respectively, a Unit 2 automatic reactor trip occurred as a result of a turbine trip due to high steam generator (SG) level. The required safety systems performed as designed, appropriate operator actions were taken to ensure the performance of system automatic actions, and the unit was quickly brought to a stable no-load condition. The cause of this event is attributed to the failure of the "B" main feedwater regulating valve (MFRV) to maintain a demand position. This condition resulted in a high SG level, the main feedwater pumps tripping, automatic start of auxiliary feedwater (AFW) pumps, turbine trip, and an automatic reactor trip. The "B" MFRV was inspected on December 18, 1991. The positioner was found to be worn and was replaced and tested. During the subsequent unit startup on December 18, 1991, a similar less severe oscillation of the subject valve was noted. Therefore, a Root Cause Evaluation is being performed to determine the cause of this condition. A non-emergency

four-hour report, pursuant to 10CFR 50.72(b)(2)(ii), was made to the Nuclear Regulatory Commission at 0235 hours on December 18, 1991. This event is being reported, pursuant to 10 CFR 50.73(a)(2)(iv), as an unplanned Engineered Safety Feature actuation as a result of a valid signal.

END OF ABSTRACT

TEXT PAGE 2 OF 3

1.0 DESCRIPTION OF THE EVENT

On December 17, 1991, at 2254 hours, with Units 1 and 2 at 100% and 23% power, respectively, a Unit 2 automatic reactor trip {EIIS-JC} occurred as a result of a turbine trip {EIIS-JI} due to high steam generator (SG) {EIIS-SB,SG} level.

This event occurred during a 150 MWe/hr turbine ramp up of Unit 2 following a startup from Cold Shutdown. At 2251 hours, feedwater {EIIS-SJ} and steam flow were matched for the "B" SG and the respective main feedwater regulating valve (MFRV) {EIIS-SJ,FCV} was placed in the automatic control mode. At approximately 2252 hours, a reactor operator observed the "B" MFRV opening and closing at a rapid rate. This condition lasted approximately 50 seconds. It was noted from Emergency Response Facility Computer System (ERFCS) {EIIS-NC,CPU} data that during this period of time feedwater header pressure underwent significant perturbations. At 2253 hours, the "B" MFRV was returned to the manual control mode and the MFRV demand was reduced to zero in an effort to stop the oscillations. During this period, feedwater flow indications were erratic and "B" SG level rose rapidly. In approximately ten seconds SG level increased to 74% and the unit senior reactor operator directed the unit be manually tripped. Immediately following this direction, the main feedwater pumps {EIIS-SJ,P} and turbine tripped, resulting in the automatic stan of the "A" and "B" motor driven auxiliary feedwater (AFW) pumps {EIIS-JE,BA,P} and an automatic reactor trip, respectively. The reactor was manually tripped less than three seconds later.

The reactor trip breakers {EIIS-JC,BKR} were verified open and all control rods {EIIS-AA,ROD} were verified properly inserted. At 2256 hours, Reactor Coolant system (RCS) letdown {EIIS-AB} was isolated due to low pressurizer {EIIS-AB,PZR} level associated with the cooldown. Pressurizer heater breakers {EIIS-AB,BKR} opened as designed. At 2312 hours, the "A" motor driven auxiliary feedwater pump was stopped and placed in pull-to-lock. At 2325 hours, the

normal procedure for unit shutdown was initiated.

A non-emergency four-hour report, pursuant to 10CFR 50.72(b)(2)(ii), was made to the Nuclear Regulatory Commission at 0235 hours on December 18, 1991. This event is being reported, pursuant to 10 CFR 50.73(a)(2)(iv), as an unplanned Engineered Safety Feature (ESF) actuation as a result of a valid signal.

2.0 SAFETY CONSEQUENCES AND IMPLICATIONS

During this event, the required safety systems performed as designed, appropriate operator actions were taken to ensure the performance of system automatic actions, and the unit was quickly brought to a stable no-load condition. Therefore, the health and safety of the public were not affected.

TEXT PAGE 3 OF 3

3.0 CAUSE

The cause of this event is attributed to the failure of the "B" MFRV to maintain a demand position. This condition resulted in a high SG level, the main feedwater pumps tripping, automatic start of AFW pumps, turbine trip, and an automatic reactor trip.

4.0 IMMEDIATE CORRECTIVE ACTION(S)

Following the reactor trip, control room operators promptly initiated the appropriate emergency procedures to verify the reactor trip breakers were open and that all control rods were properly inserted. The Shift Technical Advisor monitored the critical safety function status trees to ensure that plant parameters remained within safe bounds.

5.0 ADDITIONAL CORRECTIVE ACTION(S)

On December 18, 1991, Engineering performed an inspection of the feedwater piping (outside containment) to assess the effects of the transient associated with the "B" MFRV oscillations. No significant displacements of feedwater piping or damaged supports {EIIS-SJ,PSP,SPT} were identified during this inspection.

6.0 ACTIONS TO PREVENT RECURRENCE

The "B" MFRV was inspected on December 18, 1991. The positioner {EIIS-SJ,FCV,FCO} was found to be worn and was replaced and tested.

During the subsequent unit startup on December 18, 1991, a similar less severe oscillation of the subject valve was noted. Therefore, a Root Cause Evaluation (RCE) is being performed to determine the cause of this condition. Based on the RCE, further corrective actions will be implemented, as appropriate.

7.0 SIMILAR EVENTS

LER 85-002-00 Reactor Trip (Low Steam Generator Level)

LER 85-013-00 Turbine Trip/Rx Trip - Hi S. G. Level

LER 89-010-00 Reactor Trip Due to Low Steam Generator Level
Following a Higher Than Expected Load Increase During
Unit Startup

8.0 MANUFACTURER/MODEL NUMBER

Manufacturer: Copes - Vulcan Inc.

Model Number: A6795-ECDI-92341 SEMI

ATTACHMENT 1 TO 9201210284 PAGE 1 OF 1

Virginia Electric and Power Company
Surry Power Station
P. O. Box 315
Surry, Virginia 23883

January 14, 1992

U. S. Nuclear Regulatory Commission Serial No.: 92-035
Document Control Desk Docket No.: 50-281
Washington, D. C. 20555 License No.: DPR-37

Gentlemen:

Pursuant to Surry Power Station Technical Specifications, Virginia Electric and Power Company hereby submits the following Licensee Event Report for Unit 2.

REPORT NUMBER

91-011-00

This report has been reviewed by the Station Nuclear Safety and Operating Committee and will be reviewed by the Corporate Management Safety Review

Committee.

Very truly yours,

M. R. Kansler
Station Manager

Enclosure

cc: Regional Administrator
Suite 2900
101 Marietta Street, NW
Atlanta, Georgia 30323

*** END OF DOCUMENT ***
